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Remarks

Applicant respectfully requests entry of the above amendment prior to examination. Claims 1-43 are presently pending. Claims 1-3, 5, 11, 12, 15, 22, 24, 26, 33, 34, 36, and 41 are amended. Claim 43 is added.

The Applicant expressly grants permission to the Office to interpret all pending claims of this application.

Herein, the "Action" or "Office Action" refers to the Office Action dated March 12, 2002 and "Advisory Action" refers to the Advisory Action dated May 30, 2002.

Allowable Subject Matter

Applicant appreciates the Office's acknowledgement that claims 3, 27-32, and 35 are allowable as is.

Applicant also appreciates the Office's statement that claims 6-8 and 40-41 would be allowable if rewritten in independent form. Applicant has chosen not to amend claims 6-8 and 40-41 to make them independent. These amendments do not narrow the scope of these claims since it merely moves the text of the base claims into the body of the formerly dependent claims.

Prior Art Status of References

Applicant does not explicitly or implicitly admit that any reference is prior art. Nothing in this communication should be considered an acknowledgement, acceptance, or admission that any reference is considered prior art.

Traversal of Official Notices

In a prior Office Action (dated October 2, 2001), the Office rejected claims 5, 9, 10, 11, 20, 24, 15, 19, and 32, at least in part, by taking Official Notice. Also, other claims (such as claims 6 and 7) were rejected, at least in part, based upon reasoning the Office used for the above claims—which rely on the taking of Official Notice.

In Applicant's response to that Action, Applicant traversed the Official Notices for each rejected claim. Applicant disagreed with the Office's contentions. The Applicant still traverses and disagrees with the taking of Official Notice.

Applicant requested that the Office provide one or more affidavits setting forth the details of each contention of these rejected claims. The Office is required to provide such an affidavit, when requested, under 37 C.F.R. §1.104(d)(2).

In the last Office Action, the Office indicates that Applicant's traversal was insufficient to warrant evidentiary action by the Office. The Office indicated that it need not produce proof of its assertions. Specifically, the Office states that Applicant "has not provided adequate information or argument that on its face creates a reasonable doubt." The Office cites MPEP 2144.03 to support its position.

Applicant respectfully submits that the patent rules (under 37 C.F.R) require the Office to provide support of its assertions of personal knowledge once the Applicant has called for such. While the MPEP is a useful guide to understanding the patent laws and rules, it does not have the force of the law or rules.

1 The Forward of the MPEP specifically states that the MPEP “does not have
2 the force of law or the force of the rules in Title 37 of the Code of Federal
3 Regulations.” So, regardless of how one reads or interprets the MPEP, the patent
4 rules, under 37 C.F.R. §1.104(d)(2), state:

5 When a rejection in an application is based on facts within the
6 personal knowledge of an employee of the Office, the data shall be
7 as specific as possible, and *the reference must be supported, when*
8 *called for by the applicant, by the affidavit of such employee,* and
such affidavit shall be subject to contradiction or explanation by the
affidavits of the applicant and other persons. [emphasis added]

9 Applicant has called and continues to call for the “personal knowledge of
10 an employee of the Office” to be supported by an affidavit by such employee.
11 Furthermore, the MPEP 2144.03 specifically states, “If the applicant traverses
12 such an assertion [of personal knowledge] the examiner should cite a reference in
13 support of his or her position.”

14 Here, the Office has not supported its position. It has neither cited a
15 reference nor provided affidavits.

16
17 **Suggested Amendment with “either”**

18 Applicant appreciates the Office’s discussion and suggested amendment on
19 pages 2-3 (paragraph #4) of the Action. In accordance with this suggestion,
20 Applicant amends claim 2. Furthermore, Applicant amends other claims
21 accordingly. Such amendments address some of the issues raised by the Office in
22 its substantive rejections.
23
24
25

Mintzer

Applicant appreciates the Office's comments in the Office Action in paragraphs #6 and 7 on page 3 of the Action. Applicant suspects that these comments are moot after amendments made in accordance with that suggested in paragraph #4. In addition, Applicant amends claims 26 and 34 in accordance with the Office's suggestion.

Claim 12 and Linnartz

Applicant appreciates the Office's comments in paragraph #8 on pages 3 and 4 of the Action. In accordance with the Office's suggestion, Applicant amends claim 12 to specify "or" instead of "and." Furthermore, Applicant adds an "input module" to claim 12 to receive the watermarked signal. Therefore, the synchronization module has the input from the input module.

Other Paragraphs

The remarks below address the Office's comments in paragraphs 9-12 of pages 4 and 5 of the Action.

Substantive Claim Rejections

Claim Rejections under §102 and §103

The Office rejects all pending claims under §102 and §103. For the reasons set forth below, the Office has not made out a *prima facie* case of anticipation (i.e., §102). Likewise, for the reasons set forth below, the Office has not made out a *prima facie* case of obviousness (i.e., §103). Accordingly, Applicant respectfully requests that the rejections be withdrawn and the case be passed along to issuance.

The Office's rejections are based upon one or more of the following references (in combination or alone):

- **Mintzer:** *Mintzer et al.*, "If One Watermark is Good, Are More Better?", Acoustic, Speech, and Signal Processing, vol. 4, pp. 2067-2069, 1999;
- **Linnartz:** *Linnartz*, US Patent No. 5,933,798; and
- **Levine:** *Levine et al.*, US Patent No. 6,209,094.

Anticipation Rejections

The §102 (Anticipation) Standard

In making out a §102 rejection, the Federal Circuit has stated that a reference anticipates a claim if it discloses every element of the claim. *See Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991); *Richard v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

1 Thus, anticipation is determined by “identify[ing] the elements of the
2 claims, determin[ing] their meaning in light of the specification and prosecution
3 history, and identify[ing] corresponding elements disclosed in the allegedly
4 anticipating reference.” Lindermann Maschinenfabrik GMBH v. American Hoist
5 & Derrick Co., 730 F.2d 1452, 1458 (Fed. Cir. 1984).

6 Consequently, if any claimed element is missing from the allegedly
7 anticipating reference, then anticipation is negated. Kloster Speedsteel AB v.
8 Crucible Inc., 793 F.3d 1565, 1571 (Fed. Cir. 1987). Close is not enough. Every
9 element in the claim must exist in the allegedly anticipating reference for the §102
10 rejection to stand.

11 **Claims 1, 4, 22, 26, 33, and 34**

12
13 The Office rejects claims 1, 4, 22, 26, 33, and 34 under 35 USC §102(a) as
14 being clearly anticipated by Mintzer.

15 **Claim 1**

16
17 Mintzer does not disclose every element of amended claim 1. For example,
18 the claim recites a watermark insertion unit to “...*selectively choose* insertion of
19 *either* the strong watermark *or* the weak watermark into segments of the audio
20 signal ...” (emphasis added).

21 Mintzer does not disclose this. In fact, Mintzer discloses, teaches, suggests,
22 and motivates one to overcome the problems of inserting multiple disparate
23 watermarks by layering the insertion of the multiple watermarks within the same
24 portions. It does not teach insertion of either one more or another.
25

1 For the above reasons, Mintzer does disclose every element of claim 1.
2 Accordingly, Mintzer does not anticipate claim 1. Applicant asks that the Office
3 withdraw this rejection.

4 Claims 4, 22, 26, 33, and 34

5 Although these claims are different from claim 1, Applicant submits that
6 these claims are allowable for, at least, some of the same reasons given above in
7 the discussion of claim 1.

8 For the above reasons, Mintzer does disclose every element of these claims.
9 Accordingly, Mintzer does not anticipate these claims. Applicant asks that the
10 Office withdraw this rejection.

11 Claims 12-14 and 16

12
13 The Office rejects these claims under 35 USC §102(e) as being clearly
14 anticipated by Linnartz. Applicant expressly reserves the right to file a §131
15 declaration with respect to Linnartz.

16 Claim 12

17 Linnartz does not disclose every element of claim 12. For example, the
18 claim recites a correlation module to “...*detect whether either* a strong watermark
19 *or* a weak watermark is present *in the portion* of the watermarked audio signal...”
20 (emphasis added).

21 Linnartz simply does not disclose the presence of one of multiple
22 watermarks within a watermarked signal. Linnartz discloses detection of a single
23 watermark within a signal. According to the legal standard for anticipation under
24 §102 (as discussed above), Linnartz cannot anticipate claim 12 because it does not
25 disclose *every* element of the claim.

1 Furthermore, the claim recites a "...*synchronization module to determine*
2 *which portion* of a watermarked audio signal might contain a watermark..."
3 (emphasis added). Linnartz does not disclose a synchronization module.
4 Furthermore, it does not teach such a module that determines which portion of the
5 signal might contain a watermark.

6 The claims now expressly include an "input module" for receiving the
7 input.

8 For the above reasons, Linnartz does disclose every element of claim 12.
9 Accordingly, Linnartz does not anticipate claim 12. Applicant asks that the Office
10 withdraw this rejection.

11 Claims 13, 14 and 16

12 Although these claims are different from claim 12, Applicant submits that
13 these claims are allowable for, at least, some same reasons given above in the
14 discussion of claim 12.

15 For the above reasons, Linnartz does disclose every element of these
16 claims. Accordingly, Linnartz does not anticipate these claims. Applicant asks that
17 the Office withdraw this rejection.

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Obviousness Rejections

The §103 (Obviousness) Standard

In making out a §103 rejection, the Federal Circuit has stated that when one or more reference or source of prior art is required in establishing obviousness, “it is necessary to ascertain whether the prior art *teachings* would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitutions or other modification.” *In re Fine*, 5 USPQ 2d, 1596, 1598 (Fed. Cir. 1988). That is, to make out a prima facie case of obviousness, the references must be examined to ascertain whether the combined *teachings* render the claimed subject matter obvious. *In re Wood*, 202 USPQ 171, 174 (C.C.P.A. 1979).

Moreover, there is a requirement that there must be some reason, suggestion, or motivation *from the prior art*, as a whole, for the person of ordinary skill to have combined or modified the references. *See, In re Geiger*, 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). It is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the prior art so that the claimed invention is rendered obvious. One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fritch*, 23 USPQ 2d 1780, 1784 (Fed. Cir. 1992).

A factor cutting against a finding of motivation to combine or modify the prior art is when the prior art *teaches away* from the claimed combination. A reference is said to teach away when a person of ordinary skill, upon reading the reference, would be led in a direction divergent from the path that the applicant took. *In re Gurley*, 31 USPQ 2d 1130, 1131 (Fed. Cir 1994).

1 In addition, the references must either be in the field of the inventor's
2 endeavor, or reasonably pertinent to the specific problem with which the inventor
3 was involved. *In re Deminski*, 230 USPQ 313, 315 (Fed. Cir. 1986). Put another
4 way, the references must be in an art *analogous* to that of the invention.

5 In order for a prima facie case of obviousness to be made, the resulting
6 combination or motivation must appear to show or suggest the claimed invention.
7 *In re Nielson*, 2 USPQ 2d1525, 1528 (Fed. Cir. 1987).

8 **The Office Has Not Made Out a Case of Prima Facie Obviousness**

9 Applicant disagrees with the Office's obviousness rejections and
10 respectfully submits that the Office has not made out a *prima facie* case of
11 obviousness. Accordingly, Applicant respectfully requests withdrawal of these
12 rejections.
13

14 **Claims 2, 36-39, and 42**

15 The Office rejects these claims under 35 USC §103(a) as being
16 unpatentable over Mintzer in view of Levine.

17 The Office relies on Mintzer for the primary basis for this rejection. As
18 explained above (in section titled "Mintzer" and in the discussion of claim 1),
19 Mintzer discloses, teaches, suggests, and motivates one to overcome the problems
20 of inserting multiple disparate watermarks by layering the insertion of the
21 watermarks within the same portion of the signal. The watermark insertion unit of
22 this claim does not use the watermark layering technique suggested by Mintzer.

23 Furthermore, Levine is not concerned with multiple disparate watermarks.
24 Rather, it is focused on increasing the robustness of a watermark in an audio signal
25

1 and thereby making it more difficult to attack. Therefore, Levine's discussion (in
2 lines 45-51 of col. 5) about audible range of the human listener is emphasizing the
3 benefits of embedding watermarks in the audible range to enhance their
4 robustness.

5 Mintzer is about layering multiple marks, but no distinction is made as to
6 where. Levine is about inserting a single mark in a particular portion of a signal.
7 Combining to two produces a system that layers multiple watermarks in a
8 particular portion of a signal. That is not what claims 2, 36-39, and 42 cover.

9 Mintzer and Levine reveal no motivation to combine their teachings.
10 Furthermore, the combination of these teachings does not result in what is recited
11 by this claim. Accordingly, this claim is not obvious for the above reasons.
12 Applicant asks that the Office withdraw this rejection.

13 **Claims 5, 10, 11, and 24**

14
15 The Office rejects these claims under 35 USC §103(a) as being
16 unpatentable over Mintzer in view of Levine as applied to the Office's reasoning
17 for rejecting claim 2.

18 As discussed above (with respect to claim 2), there is no motivation to
19 combine teachings of Mintzer and Levine.

20 Although the Office acknowledges that neither reference discloses a
21 determination "of the absolute magnitude of a sound and using that to determine if
22 the data is audible," the Office takes Official Notice of such. As indicated above
23 (in the titled "Traversal of Official Notices"), Applicant traverses this Official
24 Notice. Applicant requests that the Office provide one or more affidavits setting
25 forth the details of the Office's contention. Applicant asks for the Office to

1 provide motivation for combining the details of that affidavit with the teachings of
2 Mintzer and Levine.

3 There is no motivation to combine the teachings of any of these references
4 and the Official Notice. Furthermore, the combination of these teachings does not
5 result in what is claimed by these claims. Accordingly, these claims are not
6 obvious for the above reasons. Applicant asks that the Office withdraw this
7 rejection.

8 **Claim 9**

9
10 The Office rejects this claim under 35 USC §103(a) as being unpatentable
11 over Mintzer in view of Levine as applied to the Office's reasoning for rejecting
12 claim 5.

13 As discussed above (with respect to claim 5), there is no motivation to
14 combine teachings of Mintzer and Levine.

15 Although the Office acknowledges that neither reference discloses "a
16 compression unit, wherein the compression unit and the audio watermark
17 encoding system both utilize the magnitude components," the Office takes Official
18 Notice of such. As indicated above (in the titled "Traversal of Official Notices"),
19 Applicant traverses this Official Notice. Applicant requests that the Office provide
20 one or more affidavits setting forth the details of the Office's contention.
21 Applicant asks for the Office to provide motivation for combining the details of
22 that affidavit with the teachings of Mintzer and Levine.

23 There is no motivation to combine the teachings of any of these references
24 and the Official Notice. Furthermore, the combination of these teachings does not
25

1 result in what is claimed by this claim. Accordingly, these claims are not obvious
2 for the above reasons. Applicant asks that the Office withdraw this rejection.

3 **Claims 17, 18, 21, and 25**

4
5 The Office rejects these claims under 35 USC §103(a) as being
6 unpatentable over Linnartz in view of Mintzer and Levine.

7 As discussed above, there is no motivation to combine teachings of Mintzer
8 and Levine. In addition, these claims recite a “converter to convert a watermarked
9 audio signal into magnitude and phase components” and a “mask processor to
10 determine a hearing threshold for corresponding magnitude components.” The
11 Office has cited no reference that contains the converter and mask processor of
12 these claims.

13 Linnartz is focused on single watermarks while Mintzer provides no
14 implementation details on how to embed or detect multiple watermarks. However,
15 the Office has given no reasoning to believe that element 21 of Linnartz (which
16 the Office says anticipates a pattern generator) and that element 24 (which the
17 Office says anticipates a detector) are capable of accommodating multiple
18 disparate watermarks.

19 There is no motivation to combine the teachings of any of these references.
20 Furthermore, the combination of these teachings does not result in what is claimed
21 by these claims. Accordingly, these claims are not obvious for the above reasons.
22 Applicant asks that the Office withdraw this rejection.
23
24
25

1 **Claim 20**

2 The Office rejects this claim under 35 USC §103(a) as being unpatentable
3 over Linnartz, Mintzer, and Levine as applied to the Office's reasoning for
4 rejecting claim 17.

5 As discussed above (with respect to claim 17), there is no motivation to
6 combine teachings of Mintzer and Levine. Furthermore, these references do not
7 disclose, teach, or suggest all of the elements claimed by claim 20.

8 Although the Office acknowledges that neither reference discloses "a
9 decompressor," the Office takes Official Notice of such. As indicated above (in
10 the titled "Traversal of Official Notices"), Applicant traverses this Official Notice.
11 Applicant requests that the Office provide one or more affidavits setting forth the
12 details of the Office's contention. Applicant asks for the Office to provide
13 motivation for combining the details of that affidavit with the teachings of Mintzer
14 and Levine.

15 There is no motivation to combine the teachings of any of these references
16 and the Official Notice. Furthermore, the combination of these teachings does not
17 result in what is claimed by this claim. Accordingly, these claims are not obvious
18 for the above reasons. Applicant asks that the Office withdraw this rejection.
19
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Claim 23

The Office rejects this claim under 35 USC §103(a) as being unpatentable over Mintzer in view of Linnartz. In addition to other reasons, this claim is allowable because its base claim (claim 22) is allowable.

Claims 15 and 19

The Office rejects these claims under 35 USC §103(a) as being unpatentable over Mintzer, Levine, and Adler as applied to the Office's reasoning for rejecting claims 12, 17, and 27.

Although the Office acknowledges that neither reference discloses that "the correlation value must be exceeded by a random number," the Office takes Official Notice of such. As indicated above (in the titled "Traversal of Official Notices"), Applicant traverses this Official Notice. Applicant requests that the Office provide one or more affidavits setting forth the details of the Office's contention. Applicant asks for the Office to provide motivation for combining the details of that affidavit with the teachings of Mintzer, Levine, and Adler.

As discussed above, there is no motivation to combine teachings of Mintzer, Levine, and/or Adler. Also, as discussed above, Adler is not applicable. In addition to other reasons, these claims are allowable because their base claims are allowable.

1 **Dependent Claims**

2 In addition to other possible reasons, each dependent claim is allowable for
3 the same reasons that its base claim is allowable. Applicant submits that the
4 Office withdraw the rejection of each dependent claim where its base claim is
5 allowable.
6

7 **Claim Amendments**

8 All of the claim amendments are done to make the claim language more
9 readable, linguistically clearer, and/or grammatically correct. None of the
10 amendments is done to meet any statutory requirement. None narrows the scope of
11 the claims within the meaning of *Festo Corp. V. Shoketsu Kinzoku Kogyo*
12 *Kabushiki Co.*, 56 USPQ2d 1865 (Fed. Cir. 2000).

13 For example, claim 3 was amended to clarify the grammar and thus clarify
14 its meaning. Since the claim was already allowable, amendment to this claim was
15 clearly not intended to avoid any prior art.

16 All of the amended claims (1-3, 5, 11, 12, 15, 22, 24, 26, 33, 34, 36, and
17 41) were amended for other similar reasons.
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1 Conclusion

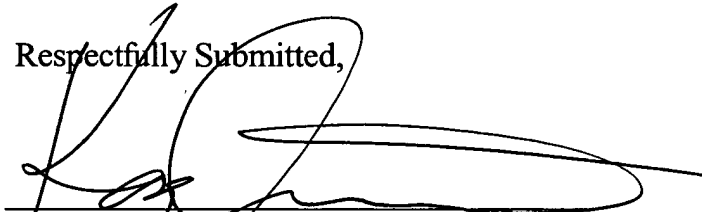
2 All pending claims are in condition for allowance. Applicant respectfully
3 requests reconsideration and prompt issuance of the application. If any issues
4 remain that prevent issuance of this application, the Office is urged to contact the
5 undersigned attorney before issuing a subsequent Action.

6
7
8
9 Dated:

6-12-02

By:

Respectfully Submitted,


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1 **Amended Claims (and the non-amended pending claims)**

2 **(in Marked-up Form, in accordance with 37 CFR §1.121):**

3
4
5 Please amend claims 1-3, 5, 11, 12, 15, 22, 24, 26, 33, 34, 36, and 41 as indicated
6 below:

7
8 1. **(TWICE AMENDED)** An audio watermarking system comprising
9 a pattern generator to generate both a strong watermark and a weak
10 watermark; and
11 a watermark insertion unit to selectively choose insertion of either the
12 strong watermark or the weak watermark into segments of the audio signal.

13
14 2. **(TWICE AMENDED)** An audio watermarking system comprising:
15 a pattern generator to generate both a strong watermark and a weak
16 watermark; and
17 a watermark insertion unit to insert the strong watermark and the weak
18 watermark into the audio signal,

19 wherein the watermark insertion unit selectively inserts either the strong
20 watermark or the weak watermark into segments of the signal according to an
21 audible measure of the segments.
22
23
24
25

1 **3. (TWICE AMENDED)** An audio watermarking system comprising:
2 a pattern generator to generate both a strong watermark and a weak
3 watermark;
4 a watermark insertion unit to insert the strong watermark and the weak
5 watermark into the audio signal;
6 a processor to determine a hearing threshold for the audio signal; and
7 the watermark insertion unit inserts the strong watermark when the signal
8 exceeds the hearing threshold and ~~insert~~ inserts the weak watermark when the
9 signal falls below the hearing threshold.

10
11 **4.** An operating system comprising an audio watermarking system as
12 recited in claim 1.

13
14 **5. (AMENDED)** An audio watermark encoding system comprising:
15 a converter to convert an audio signal into magnitude and phase
16 components;
17 a mask processor to determine a hearing threshold for corresponding
18 magnitude components;
19 a pattern generator to generate both a strong watermark and a weak
20 watermark; and
21 a watermark insertion unit to selectively insert one of either the strong
22 watermark or the weak watermark into the audio signal based on whether the
23 magnitude components exceed or fall below the hearing threshold.

1 6. An audio watermark encoding system as recited in claim 5, wherein
2 the watermark insertion unit inserts the strong watermark when the magnitude
3 component exceeds the hearing threshold and inserts the weak watermark when
4 the magnitude component falls below the hearing threshold.

5
6 7. An audio watermark encoding system as recited in claim 5, wherein
7 the watermark insertion unit inserts the strong watermark when the magnitude
8 component exceeds the hearing threshold by a predetermined amount and inserts
9 the weak watermark when the magnitude component falls below the hearing
10 threshold by the predetermined amount.

11
12 8. An audio watermark encoding system as recited in claim 7, wherein
13 the watermark insertion unit foregoes inserting the strong watermark or the weak
14 watermark when the magnitude component lies within the predetermined amount
15 above and below the hearing threshold.

16
17 9. An audio encoding system comprising:
18 an audio watermark encoding system as recited in claim 5; and
19 a compression unit, wherein the compression unit and the audio watermark
20 encoding system both utilize the magnitude components.

21
22 10. An operating system comprising an audio watermark encoding
23 system as recited in claim 5.
24
25

11. (AMENDED) A watermark insertion unit, comprising:

an input to receive frequency magnitude components of an audio signal,
hearing thresholds derived from the magnitude components, strong watermark
values, and weak watermark values; and

multiple insertion operators for selectively combining the magnitude
components and one of either the strong watermark values or the weak watermark
values depending upon whether the magnitude components exceed or fall below
the hearing thresholds.

12. (AMENDED) An audio watermark detection system, comprising:

an input module to receive a watermarked audio signal;

a synchronization module to determine which portion of thea watermarked
audio signal might contain a watermark; and

a correlation module to detect whether either a strong watermark and/or a
weak watermark is present in the portion of the watermarked audio signal.

13. An audio watermark detection system as recited in claim 12,
wherein the correlation module computes a correlation value from the
watermarked audio signal and the strong watermark that tends toward a first value
when the strong watermark is present and a second value when the strong
watermark is not present.

1 14. An audio watermark detection system as recited in claim 12,
2 wherein the correlation module computes a correlation value from the
3 watermarked audio signal and the weak watermark that tends toward a first value
4 when the weak watermark is present and a second value when the weak watermark
5 is not present.

6
7 15. **(AMENDED)** An audio watermark detection system as recited in
8 claim 12, wherein the correlation module computes a correlation value from the
9 watermarked audio signal and one of either the strong watermark or the weak
10 watermark, the correlation module determining that said one strong watermark or
11 weak watermark is present when the correlation value exceeds a predetermined
12 threshold plus a random amount.

13
14 16. An operating system comprising an audio watermark detection
15 system as recited in claim 12.

16
17 17. An audio watermark detection system comprising:
18 a converter to convert a watermarked audio signal into magnitude and
19 phase components;
20 a mask processor to determine a hearing threshold for corresponding
21 magnitude components;
22 a pattern generator to generate both a strong watermark and a weak
23 watermark; and
24 a watermark detector to detect presence of the strong watermark and the
25 weak watermark in the audio signal.

1
2 **18.** An audio watermark detection system as recited in claim 17,
3 wherein the watermark detector computes correlation values from the
4 watermarked audio signal and each of the strong watermark and the weak
5 watermark and detects the presence of the strong watermark and the weak
6 watermark based on whether the correlation values exceed a predetermined
7 threshold.

8
9 **19.** An audio watermark detection system as recited in claim 17, further
10 comprising:

11 a random operator for generating a random value; and
12 the watermark detector computes correlation values from the watermarked
13 audio signal and each of the strong watermark and the weak watermark and
14 detects the presence of the strong watermark and the weak watermark based on
15 whether the correlation values exceed a predetermined threshold plus the random
16 value.

17
18 **20.** An audio decoding system comprising:
19 an audio watermark detection system as recited in claim 17; and
20 a decompression unit, wherein the decompression unit and the audio
21 watermark detection system both utilize the magnitude components.

22
23 **21.** An operating system comprising an audio watermark detection
24 system as recited in claim 17.
25

1 **22. (TWICE AMENDED)** An audio watermarking architecture,
2 comprising:

3 a watermark encoding system to selectively choose insertion of either a
4 strong watermark or a weak watermark into segments of an audio signal; and
5 a watermark detecting system to detect a presence of either the strong
6 watermark or the weak watermark in the segments of the audio signal.

7
8 **23.** An audio watermarking architecture as recited in claim 22, wherein
9 the watermark encoding system resides at a content producer to watermark
10 original audio content and the watermark detecting system resides at one or more
11 clients to detect the watermarks and play the original audio content.

12
13 **24. (AMENDED)** An audio watermarking architecture as recited in
14 claim 22, wherein the watermark encoding system comprises:

15 a converter to convert the audio signal into magnitude and phase
16 components;

17 a mask processor to determine a hearing threshold for corresponding
18 magnitude components;

19 a pattern generator to generate both the strong watermark and the weak
20 watermark; and

21 a watermark insertion unit to selectively insert one of either the strong
22 watermark or the weak watermark into the audio signal based on whether the
23 magnitude components exceed or fall below the hearing threshold.
24
25

1 25. An audio watermarking architecture as recited in claim 22, wherein
2 the watermark detecting system comprises:

3 a converter to convert a watermarked audio signal into magnitude and
4 phase components;

5 a mask processor to determine a hearing threshold for corresponding
6 magnitude components;

7 a pattern generator to generate both a strong watermark and a weak
8 watermark; and

9 a watermark detector to detect presence of the strong watermark and the
10 weak watermark in the audio signal.

11
12 26. **(TWICE AMENDED)** A method for watermarking an audio signal,
13 comprising:

14 watermarking a first portion of the audio signal with a strong watermark;
15 and

16 watermarking a second portion of the audio signal with a weak watermark,
17 wherein the first and second portions are separated distinguishable.

18
19 27. A method for watermarking an audio signal, comprising:

20 comparing samples of the audio signal to a hearing threshold;

21 watermarking samples exceeding the hearing threshold with a strong
22 watermark; and

23 watermarking samples falling below the hearing threshold with a weak
24 watermark.

1 **28.** A method as recited in claim 27, wherein the watermarking samples
2 comprises:

3 watermarking samples exceeding the hearing threshold plus a buffer value
4 with a strong watermark;

5 watermarking samples falling below the hearing threshold by less than the
6 buffer value a with a weak watermark; and

7 leaving samples lying within the buffer value above and below the hearing
8 threshold without a watermark.

9
10 **29.** A method as recited in claim 27, further comprising detecting the
11 strong watermark and the weak watermark in the audio signal.

12
13 **30.** A method as recited in claim 29, wherein the detecting comprises
14 computing a correlation value from the audio signal and the strong watermark, the
15 correlation value tending toward a first value when the strong watermark is present
16 and a second value when the strong watermark is not present.

17
18 **31.** A method as recited in claim 29, wherein the detecting comprises
19 computing a correlation value from the audio signal and the weak watermark, the
20 correlation value tending toward a first value when the weak watermark is present
21 and a second value when the weak watermark is not present.

1 32. A method as recited in claim 27, further comprising:
2 computing a correlation value from the audio signal and one of the strong
3 watermark or the weak watermark; and
4 determining that said one strong watermark or weak watermark is present
5 when the correlation value exceeds a predetermined threshold plus a random
6 amount.

7
8 33. (TWICE AMENDED) A method comprising:
9 selectively encoding portions of an audio signal with either a strong
10 watermark or a weak watermark; and
11 detecting a presence of the strong watermark and the weak watermark in
12 the audio signal.

13
14 34. (TWICE AMENDED) A computer readable medium having
15 computer executable instructions for:
16 watermarking a first portion of an audio signal with a strong watermark;
17 and
18 watermarking a second portion of the audio signal with a weak watermark,
19 wherein the first and second portions are separated distinguishable.
20
21
22
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25

1 35. A computer readable medium having computer executable
2 instructions for:

3 comparing samples of an audio signal to a hearing threshold;
4 watermarking samples exceeding the hearing threshold with a strong
5 watermark; and
6 watermarking samples falling below the hearing threshold with a weak
7 watermark.

8
9 36. (AMENDED) An audio watermarking system comprising:
10 a pattern generator to generate both a strong watermark and a weak
11 watermark; and
12 a watermark insertion unit to insert the strong watermark and the weak
13 watermark into the audio signal,
14 wherein the watermark insertion unit selectively choose insertion of either
15 the strong watermark or the weak watermark into segments of the signal according
16 to an audible measure of the segments.

17
18 37. An audio watermarking system comprising
19 a pattern generator to generate both a strong watermark and a weak
20 watermark; and
21 a watermark insertion unit to insert of the strong watermark into one or
22 more first segments of the audio signal and to insert of the weak watermark into
23 one or more second segments of the audio signal, wherein the first and second
24 segments are distinguishable.
25

1 38. An audio watermarking system as recited in claim 37, wherein the
2 watermark insertion unit selectively chooses segments for insertion of the
3 watermarks according to an audible measure of the segments.

4
5 39. An audio watermarking system as recited in claim 37, wherein the
6 watermark insertion unit selectively chooses segments for insertion of the strong
7 watermark according to an audible measure of the segments.

8
9 40. An audio watermarking system as recited in claim 37, wherein the
10 watermark insertion unit selectively chooses segments for insertion of the weak
11 watermark according to an audible measure of the segments.

12
13 41. (AMENDED) An audio watermarking system as recited in claim
14 37, further comprising:

15 a processor to determine a hearing threshold for segments of the audio
16 signal; and

17 the watermark insertion unit inserts the strong watermark into a segment
18 when the signal of that segment exceeds the hearing threshold and ~~insert~~ inserts
19 the weak watermark into a segment when the signal of that segment falls below
20 the hearing threshold.

21
22 42. An operating system comprising an audio watermarking system as
23 recited in claim 37.
24
25

1 **NEW CLAIMS:**

2

3 **43.** A method as recited in claim 27, further comprising:

4 computing a correlation value from the audio signal and one of either the

5 strong watermark or the weak watermark; and

6 determining that either said one strong watermark or said one weak

7 watermark is present when the correlation value exceeds a predetermined

8 threshold plus a random amount.

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